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Photoemission Lineshape Study on $\text{La}_{0.7}\text{Sr}_{0.3}\text{Mn}_{1-\delta}\text{Al}_\delta\text{O}_3$ ($\delta = 0, 0.03, 0.06$)

Han-Jin Noh¹, K.H. Kim², E.-J. Cho³, S.-J. Oh¹

¹ *School of Physics and Center for Strongly Correlated Materials Research, Seoul National University, Seoul, South Korea*

² *School of Physics, Seoul National University, Seoul, South Korea*

³ *Dept. of Physics, Chonnam National University, Kwangju, South Korea*

We have studied the lineshapes of ultraviolet photoemission spectra of $\text{La}_{0.7}\text{Sr}_{0.3}\text{Mn}_{1-\delta}\text{Al}_\delta\text{O}_3$ ($\delta = 0, 0.03, 0.06$) systems to test the extrinsic effect in photoemission recently suggested by R. Joynt⁽¹⁾. He argued that the photoemission spectrum near Fermi energy, specially for poorly conducting system, can be very different from the intrinsic density of states because the outgoing electron has probability of losing its kinetic energy due to the image force. We tested this argument in real materials experimentally by measuring the photoemission lineshapes of $\text{La}_{0.7}\text{Sr}_{0.3}\text{Mn}_{1-\delta}\text{Al}_\delta\text{O}_3$ systems, for which all the requirements are satisfied and sample resistivities change systematically. Experimental results show that the extrinsic effect does not make any difference on the lineshapes of photoemission spectra, and we conclude that the influence of this long range interaction is not so large as suggested in Joynt's paper.

(1) Robert Joynt, Science **284**, 777 (1999).